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TECHNOLOGY TRANSFER TOOLBOOK

A Research Paper

Presented To

The Directorate of Research

Air Command and Staff College

In Partial Fulfillment of the Graduation Requirements of ACSC

by

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May 1995

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Preface

Recent changes in law provide unprecedented incentives for government organizations to “market” their products to the commercial world. The very real potential exists for Air Command and Staff College to capitalize on their investment in multimedia interactive courseware through mutual agreements with the private sector. By transferring government owned technology to commercial businesses, Department of Defense organizations can potentially receive profit from its transferred technology, methods, and processes from royalties and fees.

This effort could not have been accomplished without the assistance of several organizations. We would like to thank the people of the Technology Transfer Office at the National Aeronautics and Space Administration (NASA) Marshall Space Flight Center in Huntsville, Alabama. Their personal interviews and willingness to furnish any and all information, frequently on short notice, to support a program they deeply believe in was invaluable to telling the story of the NASA technology transfer program.

We also extend a very special thanks to the personnel from the Air Force Technology Transition Office and the Air Force Institute of Technology at Wright-Patterson AFB, Ohio, and the Armstrong Laboratory at Brooks AFB, Texas. We’re standing on the shoulders of what they have accomplished. They provided that first step.

We would also like to thank Glenn Woody, Air Force Materiel Command (AFMC/JAS), for his special guidance on the legal aspects of technology transfer.

Finally, we would like to give a very special thanks to our faculty advisor, Lt Col Pat Nutz. His vision and assistance with research, direction, organization, and direct individual support made this research project a complete success.

Table of Contents

	<i>Page</i>
PREFACE.....	ii
ABSTRACT.....	v
CHAPTER 1: BACKGROUND AND STATEMENT OF PROBLEM.....	1
CHAPTER 2: LITERATURE REVIEW/METHODOLOGY	3
Literature Review	3
Methodology	3
CHAPTER 3: TECHNOLOGY TRANSFER PROCESS BACKGROUND.....	5
CHAPTER 4: SUCCESSFUL TRANSFER PROCESSES	6
National Aeronautics and Space Administration (NASA)	6
NASA Marshall Space Flight Center	7
NASA Marshall Space Flight Center Metrics	7
Air Force Material Command (AFMC)	8
AFMC Technology Transfer Office (TTO).....	8
AFMC Government Technology Transfer	9
AFMC Technology Transfer Mechanism.....	11
AFMC Technology Transfer—Command Metric	11
CHAPTER 5: FINDINGS AND CONCLUSIONS—ACSC PROCESS.....	13
Findings.....	13
Conclusions	15
ENDNOTES	16
BIBLIOGRAPHY	17
APPENDIX A: ACSC TECHNOLOGY TRANSFER BRIEFING	19
APPENDIX B: SAMPLE WORK PLAN	25
APPENDIX C: SAMPLE REQUEST FOR INFORMATION (RFI).....	27
VITA	28

Abstract

This research project examined current technology transfer programs and developed a template for Air Command and Staff College (ACSC) to use to transfer its research programs to the private sector. Several technology transfer processes and opportunities within the Department of Defense and the National Aeronautics and Space Administration (NASA) were analyzed.

Findings indicate transferring government-owned technology to the private sector is not only possible, but strongly encouraged. Commercializing government-owned technology is now policy directed from the national level down to the individual Service department level. The Technology Transition Office and the Air Force Institute of Technology, located at Wright-Patterson AFB, Ohio; and the Technology Transfer Office at NASA Marshall Space Flight Center in Huntsville, Alabama are currently enjoying tremendous success in the technology transfer area. ACSC, by virtue of its definition as a research producing institution, can potentially be a major player in the technology transfer process.

The product of this research is a fully integrated, user-friendly multimedia personal computer application designed to facilitate the learning process and enhance the usability of the technology transfer process. Results of this research are applicable to a wide variety of audiences and are recommended for incorporation into ACSC curriculum.

TECHNOLOGY TRANSFER TOOLBOOK

Chapter 1: Background and Statement of Problem

Transferring technology is vital to airpower, but is little understood by airpower leaders. Technology transfer improves products through shared technology, creates new businesses, makes US companies more competitive in the global market, and can improve the quality of life for citizens. By understanding technology transfer, airpower leaders at all levels within the Air Force will better understand and be able to capitalize on technology transfer opportunities. This can be done through an integrated technology transfer primer of tools, models, and information in the form of a multimedia personal computer (PC) application. Accordingly, increased awareness will lead to improvements in technology transfer efficiency resulting in cost savings to the Air Force.

Indeed, the very mission of Air Command and Staff College (ACSC) is to educate mid-career officers to develop, advance, and apply air and space power in peace and war. This mission statement essentially places a burden on all ACSC students to transfer what they gained during ACSC into mainstream Air Force. As future airpower leaders, the ACSC student must recognize the need for innovation and support its implementation.

Recent changes in law provide new opportunities for government organizations to transfer their technology to the commercial market. The potential exists for ACSC to capitalize on their investment in educational technology through mutual agreements with private buyers via third party commercial firms. The Air Force Institute of Technology

(AFIT) at Wright-Patterson AFB and the Armstrong Laboratory at Brooks AFB have already made significant progress in this area. ACSC could be a powerful player if it decides this is in their strategic interest. Clearly, collecting royalties via technology transfer of the ACSC curriculum and especially the "ToolBook" products could alleviate part of the ACSC thirsty technology budget requirement.

The scope of this effort was limited to looking at a small cross section of the technology transfer community. Only the National Aeronautics and Space Administration (NASA) and Air Force Material Command (AFMC) technology transfer efforts were studied. We recommend future efforts look at other Services, agencies, and organizations to develop a larger research base. The Army and the Navy, in particular, have well established technology transfer programs.

Chapter 2: Literature Review/Methodology

Literature Review

We used extensive sources from Air University to include sources from the Air University Library as well as information from ACSC. We used outside experts and other Department of Defense (DoD) sources, such as personal interviews conducted with NASA personnel at Marshall Space Flight Center in Huntsville, Alabama and the Air Force's Technology Transition Office (TTO) at Wright-Patterson in Dayton, Ohio. In addition, Maxwell AFB's Legal Office and Base Contracting Office, the Armstrong Laboratory at Brooks AFB, the Air Force Institute of Technology and the Aeronautical Systems Center (ASC) at Wright-Patterson AFB, and the Electronic Systems Command at Hanscom AFB were contacted to discuss various issues regarding the mechanics of technology transfer.

Methodology

Our basic methodology was to conduct research on existing technology transfer programs and propose a possible template for ACSC to use for potential candidates for technology transfer. Upon completing this research, we developed a primer ToolBook application to facilitate transfer of ACSC research to a wide audience. We identified our customers as primarily ACSC students, any Air Force organization interested in technology transfer programs, and the Air Force and NASA Technology Transfer Offices which could use this ToolBook as a tutorial on their technology transfer programs. We

recommend this ToolBook be reviewed as part of the process of transferring any ACSC technology.

Chapter 3: Technology Transfer Process Background

Technologies developed for the military are key to solving many of the national defense problems. However, many government owned technologies also have utility and application beyond the military. Our country's industries, academia, and state and local government agencies can greatly benefit from sharing our technical knowledge and expertise. We call that sharing of military technology with the private sector “technology transfer.”¹

Integrating commercial and military technologies is necessary to reduce the erosion of the defense industrial base that is undermining US national security—a problem compounded by growing budget constraints. Integrating commercial and military technologies also has the benefit of reducing the cost of defense equipment.

Technology transfer plays an important role in fostering technological innovation. It provides opportunities for employing proven technologies rather than relying solely on internal research and development (R&D) to satisfy technological needs. The use of external sources of technology tends to shorten the innovation time and can mean the difference between success or failure of the innovation. Technology transfer holds the promise of stimulating new ideas and new innovations.

The Government Accounting Office (GAO) concluded DoD should more actively pursue the transfer of technology to the civil sector. It recognized that the profit motive was sufficient in the past to cause the private sector to commercialize defense-based technologies such as computers, communication satellites, inertial navigation systems, the use of lasers for eye surgery, and infrared sensors for fire detection.²

Chapter 4: Successful Transfer Processes

National Aeronautics and Space Administration (NASA)

The National Aeronautics and Space Administration (NASA) has a number of programs to support technology transfer. The NASA Technology Commercialization Center Program involves creating and incubating new and emerging businesses around NASA technologies, and licensing technologies to existing medium and large companies with established manufacturing and marketing channels. In addition to the commercialization centers, other mechanisms employed include a network of technical assistance centers that provide, to government and industry clients, access to a great national data bank. NASA has established technology transfer offices, located at each of NASA's field centers, that serve as regional managers for the program. The NASA publication, "NASA Tech Briefs," informs potential users what technology is available for transfer.³

NASA enters into partnerships with industry for the following three reasons: Unfunded cooperation and/or assistance, public support and stimulation involving funds, and goods and/or services for direct government benefit. Each of these goals are reached by any of the following:

1. Unfunded cooperation and/or assistance: Memorandum of Understanding (MOU) or Nonreimbursable Space Act Agreement.
2. Public Support and Stimulation Involving Funds: Cooperative Agreement, Reimbursable Space Act Agreement, or Joint Sponsored Research Agreement (JSRA).
3. Cost Sharing for direct government benefit: Cost-Shared Contract.⁴

NASA Marshall Space Flight Center

NASA has technology transfer centers located at every NASA Center. Each center has its own technology transfer program, some more of a technology push and others a technology pull. NASA Marshall Space Flight Center is becoming a template for NASA technology transfer programs and will be used as an example here. Marshall has seven regions: Louisiana, Arkansas, Mississippi, Alabama, Tennessee, Georgia, and West Virginia.

Regional managers exist for each state who develop Memorandum of Agreements with the states and local businesses. The regional managers attend chamber of commerce meetings and regional technology transfers seminars. They also visit manufacturing plants. They talk to business owners and pass out problem statement forms, called "Technology Transfer Agreement Forms." These forms gather data regarding the financial capability of the business, the business' problem statement, and the help they request. Based on these forms, work agreements may be drawn up. Agreements with NASA are broken out by amount of time projected to complete the project. Those that are projected to take less than 40 hours to solve are done in-house at NASA expense under the Space Act Agreement. Larger projects are covered under a cost sharing contract.

NASA Marshall Space Flight Center Metrics

NASA Marshall Space Flight Center in Huntsville, Alabama estimates 5,300 direct and indirect jobs have been created since January 1993 through its transfer of technologies to American businesses, schools and individuals. The center estimates its impact on the

Nation's economy at \$358,368,000; with 33 states benefiting since the transfers began in 1989. Their work has benefited a myriad of industries, such as health, energy and resource management, and aviation. Their innovations have generated new businesses, modified current industrial techniques, and improved the quality of life for all of us.⁵

Air Force Materiel Command (AFMC)

The Air Force Materiel Command (AFMC) has an energized technology transfer process developed by a command-wide process action team (PAT). The AFMC process addresses technologies that exist in laboratories and product, test, and logistics centers. The technology transfer process provides the private sector access to skilled and knowledgeable people, new processes and techniques, and facilities and equipment often not available elsewhere. Transferring Air Force developed technology with potential commercial applications is part of the AFMC mission.⁶

AFMC Technology Transfer Office (TTO)

AFMC's single point of contact, the Technology Transition Office (TTO) located at Wright-Patterson AFB, Ohio, is responsible for orchestrating AFMC's technology application/insertion, promoting technology transfer information exchange, and coordinating technology transfer activities. In June 1993, the AFMC TTO established the Technology Connection, TECH CONNECT, that acts as informational gateway to AFMC technologies. TECH CONNECT is a team of government employees from various technical backgrounds with access to many databases who response to specific technical

inquiries from industry, academia, and other government organizations. They provide pertinent information and connect these organizations to government experts. AFMC has nineteen centers/laboratories across the country that serve as focal points and the Office for Research and Technology Application (ORTA) for technology transfer. Most inquiries are received by telephone, but fax and electronic mail access are also available.⁷

AFMC Government Technology Transfer

Technology transfer is accomplished in several ways. First, technology transfer occurs by providing products produced through specialized manufacturing, repair, and test capabilities.

Second, technology transfer occurs via access to various test and manufacturing facilities. Each test center has world-class facilities not found elsewhere in the Department of Defense, and sometimes nowhere else in the world. These centers are outlined below.

The Air Force Development Test Center's Test Wing manages the overall test and evaluation program at Eglin AFB, Florida. Eglin has extensive ground facilities and about 30 aircraft of various types. The test wing controls the land test range throughout the 724-square mile base complex and the 86,500 square miles of water ranges in the adjacent Gulf of Mexico.

The Arnold Engineering Development Center at Arnold AFB, Tennessee has a diverse collection of test assets that includes more than 50 aerodynamic and propulsion wind tunnels, rocket and turbine engine test cells and space environmental chambers.

The Air Force Flight Test Center at Edwards AFB, California include the test and evaluation simulator, the Benefield Anechoic Chamber, Ridley Mission Control, and the Integration Facility for Avionics Systems Testing.

Depot level maintenance and weapon system overhaul occurs at five Air Logistic Centers. Their customers include many foreign countries in addition to Defense Department organizations.

Ogden Air Logistic Center at Hill AFB, Utah operates the Air Force's worldwide overhaul and repair facility for all aircraft landing gear, breaks, struts, and wheels.

Oklahoma City Air Logistics Center at Tinker AFB, Oklahoma provides comprehensive depot maintenance on 1416 aircraft and within its six million square feet of indoor maintenance area manages more than 17,000 jet engines.

Warner Robins Air Logistics Center located at Robins AFB, Georgia manages more than 200,000 items that represent the full range of avionics functions and technology including aerospace communications and navigation equipment, airborne bomb and gun directing systems, target acquisition systems, and most Air Force airborne electronic warfare equipment.

San Antonio Air Logistics Center at Kelly AFB, Texas manufactures and machines parts for engines and fuel control systems with a unique stereo lithography system, one of the few of its kind in the world.

The Sacramento Air Logistics Center located at McClellan AFB, California has advanced capabilities in composites, microelectronics, electro-optics, software, hydraulics/pneudraulics, flexible manufacturing, and environmental technologies.

Third, technology transfer occurs by providing technical assistance with manufacturing, repair, and test capabilities.

Finally, technology transfer is achieved by providing access to some 118,500 highly professional and skilled workforce.⁸

AFMC Technology Transfer Mechanism

Agencies can transfer technology through everyday, informal interchange, or consultation among scientific and technical peers. However, more structured, formal means such as Cooperative Research and Development Agreements (CRDAs) and Small Business Innovation Research (SBIR) exist.

AFMC Technology Transfer—Command Metric

This metric measures the level of transfer activity within the command and indicates the national socio-economic benefits as characterized by cash revenues coming into the command and the number of agreements which generate revenue. The command transfer metric has two sets of dimensions which measure the input activity level and the output results level. The input activity level is measured by tracking the cumulative number of signed transfer agreements by the total amount of investment by the Air Force and the outside partner. The output result level is measured by the number of transfer agreements expected to generate cash revenues back to the Air Force by the amount of those cash revenues.⁹

Chapter 5: Findings and Conclusions—ACSC Process

Findings

The principle finding of this research is that ACSC should transfer its technology (i.e., ACSC curriculum, ToolBooks and the information they contain, and research products) to the private sector whenever possible. Based on our research, we identified a process to facilitate transfer of ACSC research and technology to the private or commercial sector.

The process for implementing technology transfer at ACSC would be a combined active (similar to NASA's process) and passive (similar to AFMC's process) process. Thus, ACSC needs more of an outreach program, the private sector will not typically know to come to them when they are in need of technological assistance. We propose ACSC implement a technology transfer program and integrate it into the already existing research program. We developed a plan to do this. (See proposed ACSC Technology Transfer Briefing in Appendix A).

Proposed Three-Step Methodology. Like good research, efficient technology transfer requires equal parts of incisive vision and detailed planning. Before deciding which technology transfer mechanisms to use, the technology itself must be assessed to determine its viability. Assessing the technology to determine how applicable it can be for a specific application is a three-step process.

Step 1: Asking the right questions. Do we have a technology to offer someone that they might want or need?

- What does ACSC have that an organization in the private sector might want?
- What does the private organization have that ACSC might want?
- Also, consider the following:
- Is it a product or process technology? Process technologies are used to manufacture/test products or as research tools/methods for developing new products.
- What is the need for this technology or product? How mature is it? What are the potential applications for a product?
- What is the intellectual property position? If information about the technology has been published (before patent), it is in the public domain.

STEP 2: Develop a work plan. To account for the collaborative work that will take place between ACSC and the private sector, a work plan (see Appendix B) and, if applicable, a corresponding Request For Information (see Appendix C) must be developed. The work plan lays out a technical description of the scope of the work to be done, how research and development responsibilities are divided between the collaborating parties, identification of anticipated contribution by each party of funds, personnel services, property, equipment and facilities, and division of responsibilities for reporting progress and results of the work. A notional framework for developing a work plan follows:

- 1.0 **TITLE:** Descriptive title of collaborative work.
- 2.0 **OBJECTIVE:** Include description of anticipated benefits for both organizations.
- 3.0 **BACKGROUND:** Include any background intellectual property rights of either party.
- 4.0 **TECHNICAL TASKS:** Describe tasks to be undertaken by both with a description and estimated value of the resources to be provided by both in the form of funds, personnel, services, property, and equipment.
- 5.0 **DELIVERABLES OR DESIRED BENEFITS:** Explain desired benefits by both.
- 6.0 **OTHER:** Provide any other information to help both parties understand their respective roles.
- 7.0 **MILESTONES:** Estimate time and completion of tasks.
- 8.0 **REPORTS:** To include final and progress reports, formats, and their schedule.¹⁰

When this is done, the most efficient transfer mechanism can then be selected.

STEP 3: Select Transfer Mechanism. Technology can be transferred in several ways. A common means is through everyday informal interchange, or consultation among scientific and technical peers. A number of more structured, formal means are available. A proven technology transfer mechanism for academic and research institutions (of which ACSC may be categorized) is the Cooperative Research and Development Agreement (CRDA). Therefore, the most suitable mechanism for ACSC to transfer its technology is through a CRDA.

Conclusions

This research project provides a valuable service to the current Air Force mission. We expect the results of this research (ACSC 95—Technology Transfer ToolBook) to be integrated into future ACSC curriculum. The ToolBook application should be augmented into a lesson regarding technology or the US industrial base with the emphasis that future airpower leaders must be aware of this process to accomplish their mission more effectively. Also, this research will be useful to the TTO as well as to all Air Force organizations that use technology or need to understand the technology transfer process to accomplish their mission.

Endnotes

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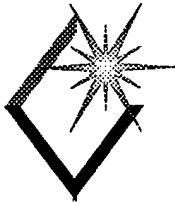
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Appendix A: ACSC Technology Transfer Briefing

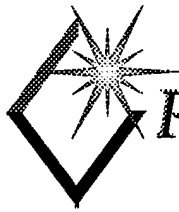
This briefing outlined the proposed ACSC Technology Transfer Program. It was presented to Col John Warden III, Commandant, Air Command and Staff College (ACSC), Maxwell AFB AL, on 14 Apr 95.

The Commandant approved the recommendations of this briefing. He directed the team to develop the details of the mechanics of the transfer program, particularly outlining the funding and agreement obligations involved. A follow-on briefing to Lt Gen Jay Kelley, Commander, HQ Air University, is planned for the May 1995 timeframe.



ACSC Technology Transfer

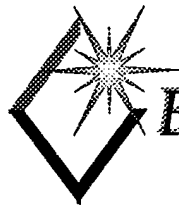
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PROBLEM STATEMENT

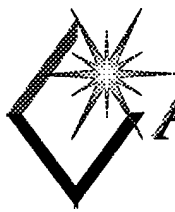
- ◆ Need for a process to make ACSC research applicable or useful to the private sector

ISSUE: ACSC is an available pool of military/ technological expertise



BACKGROUND

- ◆ What is technology transfer
 - ◆ Definition: Technology transfer may be defined as the movement of technology developed for or by the Government to the private sector for commercialization.
- ◆ Types: Active (NASA)
Passive (AFMC)



ACTIVE *vs.* PASSIVE

- ◆ Active

- ◆ Reach out and touch

- ◆ Symposiums, plant visits, chamber of commerce, regional representatives, advertisements, internet

- ◆ Passive

- ◆ Sit back and wait

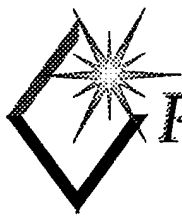
- ◆ Make information available, wait for takers



PROPOSED PROCESS

Rationale

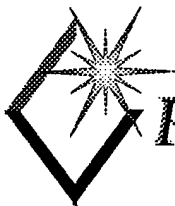
- ◆ Proposed process combines active and passive processes
- ◆ Why the need for a unique ACSC technology transfer process?
 - ◆ AFIT has established process, but also established reputation in technology and research fields
 - ◆ ACSC needs more of an outreach program



PROPOSED PROCESS

PHASE I: June-September

- ◆ Develop information packet/video on ACSC's potential for research tech transfer - ASAP
- ◆ Faculty solicits research projects, topics, areas of interest from private sectors (provide previous year's topics to potential clients) - June-August
- ◆ Faculty proposes research topics for consideration, identifying which ones have commercial applicability - August

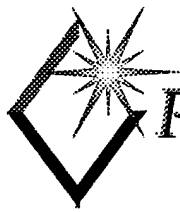


PROPOSED PROCESS (cont.)

- ◆ Student-generated proposals submitted, identifying which ones have commercial applicability - August-September

PHASE II: September-October

- ◆ Proposals screened, validating technology transfer potential
- ◆ Prioritize projects
- ◆ Select best three for development



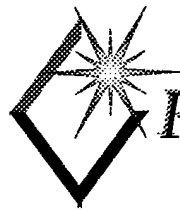
PROPOSED PROCESS (cont.)

PHASE III: October

- ◆ Develop business/work plan (Students w/ research advisor)
- ◆ Draft the CRDA

PHASE IV: November

- ◆ Write formal CRDA
- ◆ Key players (legal, contracting, ACSC, commercial counterparts)



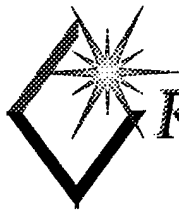
PROPOSED PROCESS (cont.)

PHASE V: November-May

- ◆ Implement CRDA--agreement complete - May
- ◆ Monitor activity

PHASE VI: April-June

- ◆ Reevaluate project for continuation/expansion of work for follow-on year



RECOMMENDATION

- ◆ Establish CRDA signature authority
 - ◆ Propose DR as signatory
- ◆ Establish CRDA reviewing authority
 - ◆ Propose ACSC/CC
- ◆ Test proposed process using a compressed timeline from April-June
 - ◆ Market Army toolbox

Appendix B: Sample Work Plan

1.0 **OBJECTIVE:** The objectives of the agreement are three-fold: 1) to establish a research relationship between the COLLABORATOR and ACSC. 2) to provide the Collaborator with a training instrument on defense concepts and capabilities designed to aid in business operations concerning various aspects of commercialization and training, 3) to provide ACSC faculty and students with exposure to and involvement in marketing, commercialization and technology transfer processes.

2.0 **BACKGROUND** COLLABORATOR is interested in understanding various defense concepts and capabilities in an effort to improve its ability to take advantage of existing government generated technology. COLLABORATOR is interested in material involving the capabilities of defense departments and defense decision making and analysis processes. The specific material which are of interest to the COLLABORATOR appear to lend themselves to an investigation consistent with ACSC research. Two specific areas of interest are (in general terms) Army operations and technology transfer.

3.0 TECHNICAL TASK

3.1 Collaborating party: COLLABORATOR will reimburse ACSC for:

ACSC Student Labor
Faculty Labor
Administrative Overhead (XX%)

TOTAL

Additionally, COLLABORATOR will provide ACSC a royalty of (XX) on each unit it commercializes and resell using government generated technology.

3.2 **UNIT:** ACSC will provide a faculty advisor and student(s) for each research topic. The student will work with the faculty advisor and COLLABORATOR representative to 1) produce mutually acceptable research project (ToolBooks); 2) complete ACSC requirements for research based on the project; and 3) present project to ACSC faculty and COLLABORATOR representative.

4.0 DELIVERABLES OR DESIRED BENEFITS:

4.1 **Benefits to the Collaborating Party:** COLLABORATOR will receive ToolBooks of Army operations and the ACSC technology transfer process that may be commercialized for profit.

4.2 Benefits to the Government: ACSC will benefit through accrued experience in the developing and packaging of related information. Additionally, ACSC may benefit monetarily through further commercialization and subsequent resale of government generated technology.

5.0 OTHER: It should be pointed out that the ACSC deliverables are free (to the best of our knowledge) from copyright violations. The COLLABORATOR is solely responsible for property protection associated with any further manipulation of the deliverables.

6.0 MILESTONES:

xx APR 95—Students make initial contacts with COLLABORATOR representative to begin process of tailoring ToolBooks for delivery

xx MAY 95—Students presented project to faculty and COLLABORATOR representative and receives go-ahead for finalization

xx JUN 95—Final copies of ToolBooks delivered to COLLABORATOR representative.

7.0 Reports: A written report consistent with ACSC research guidelines will be available.

Appendix C: Sample Request For Information (RFI)

CBD System V 4.1 Transmission from Maxwell AFB, AL.

Items 1.-16. are templates and are provided by Maxwell contracting office.

17. The Air Command and Staff College (ACSC), Maxwell Air Force Base is seeking to identify sources to enter into a Cooperative Research Development Agreement (CRDA) between ACSC and a commercial company in order to facilitate technology transfer. ACSC has several products that may be candidates for commercialization. Researchers at ACSC have developed emerging learning technologies in the areas of total quality management (TQM); the planning, programming, and budget system (PPBS); various Army, Navy, Marine, and Air Force concepts and capabilities; and technology transfer methods and recommendations to name a few. Commercialization opportunities exist in the learning technology methods as well as specific curriculum areas and course content.

ACSC is interested in helping the commercial sector better understand and learn more about Air Force technology; however, ACSC is also interested in helping commercial businesses with research needs that have potential military application as well.


The government requests that responsible firms provide basic information concerning their interest/capability in pursuing a CRDA relationship with ACSC.

This is a request for vendor interest and not a Request for Proposal (RFP). As a result of analyzing responses to this synopsis, the Government may request additional information and/or request capability discussions with responsible firms. No contract award will be made on the basis of responses received; however, this information will be used in the assessment of capable sources. No cost or pricing data is required or requested. Interested parties must respond to this notice, in writing, within 15 calendar days after publication of this notice. Send responses to:

ACSC/???
Maxwell AFB, AL 36113

Vita

Major Janet C. Karika received her commission in the United States Air Force through the Reserve Officer Training Corps in 1980. She holds bachelors and masters degrees in mechanical engineering. She served two tours in acquisition/program management, working in the space and missile fields, one tour as a research scientist for NASA, and most recently has served in logistics systems management and as an operations division chief monitoring international compliance with nuclear treaties at the Air Force Technical Applications Center (AFTAC) at Patrick AFB, FL. Her next assignment will be with the Arms Control and Disarmament Agency working counter-proliferation and technology transfer issues at the State Department, Washington DC, reporting in June 1995.



Major Ricky J. McClary received his commission in the United States Air Force through the Reserve Officer Training Corps in 1980. He obtained a Master of Science degree from the Air Force Institute of Technology majoring in System Management with emphasis in research and development management. He served fourteen years in the systems acquisition and engineering development area. His most recent assignment was in the F-22 System Program Office (SPO) as the Integrated Product Team (IPT) lead for the Vehicle Management System. His next assignment is the Production Management Staff Officer at Headquarters Defense Logistics Agency (DLA), Cameron Station, Washington DC, reporting in June 1995.

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Major Michael R. McPherson received his commission in the United States Air Force through the US Air Force Academy in 1981. He earned a Master's degree in Computer Science from the Air Force Institute of Technology and a Master's degree in Systems Management from Western New England College. He has had tours in acquisition and operational testing responsibility. His most recent tour was working for the Deputy Assistant Secretary of the Air Force for Communications, Computers and Support Systems (SAF/AQK) at the Pentagon. He was the program element monitor (PEM) for critical technology programs. His next assignment is the Deputy Commander, J64 at Offutt AFB, Nebraska reporting in June 1995.

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